

CLAIMS

1. A method of loading a container with a defined quantity of product which comprises:

- closing off a perforation in a perforated plate;
- directing powder into said closed-off perforation by the action of a first leveller blade movable on a sweeping path relative to the perforated plate; and
- transferring the contents of the perforation to said container,

wherein the first leveller blade is spaced from the perforated plate and presents a forward acute angle to the sweeping path.

2. A method according to claim 1, wherein the closing off is achievable by the use of a blanking plate.

3. A method according to claim 1, wherein the closing off is achievable by the use of a blanking pin inserted into the perforation.

4. A method according to claim 3, wherein the blanking pin is moveable within the perforation to adjust the volume of the closed-off perforation.

5. A method according to claim 1, wherein the closing off is achievable by placing a container in registration with the perforation.

6. A method according to any of claims 1 to 5, wherein the diameter of the closed-off perforation is between 1.5 and 15 mm.

7. A method according to any of claims 1 to 6, wherein said first leveller blade moves on a linear sweeping path.

8. A method according to any of claims 1 to 7, wherein the forward acute angle is between 1 and 60°.

9. A method according to claim 8, wherein the forward acute angle is between 5 and 25°.

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10. A method according to any of claims 1 to 9; wherein the first leveller blade presents multiple forward acute angles to the linear sweeping path.

11. A method according to claim 10, wherein the first leveller blade is curved in form.

12. A method according to claim 11, wherein the first leveller blade is articulated in form.

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13. A method according to any of claims 1 to 9, wherein the first leveller blade has a flat tail section.

14. A method according to any of claims 7 to 13 comprising plural movements of the first leveller relative to the perforated plate.

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15. A method according to any of claims 7 to 14, wherein a thin layer of powder is left on the perforated bed after movement of the first leveller blade.

16. A method according to claim 15, wherein the depth of said thin layer of powder is from 3 to 20 mm.

17. A method according to claim 16, wherein the depth of said thin layer of powder is from 4 to 8 mm.

18. A method according to any of claims 7 to 17, wherein the powder is further directable by at least one subsequent leveller blade.

19. A method according to claim 18, wherein the at least one subsequent leveller blade moves along the perforated plate at a lower level than that of the first leveller blade.

20. A method according to claim 19, wherein the distance between the level of movement of the first leveller blade and the at least one subsequent leveller blade is 0 to 12 mm.

21. A method according to claim 20, wherein the distance between the level of movement of the first leveller blade and the at least one subsequent leveller blade is 1 to 3 mm.

22. A method according to any of claims 1 to 7, wherein the perforated plate forms the rim of a drum.

23. A method according to claim 22, wherein the powder is directable by gravity as said drum rotates.

24. A method according to either any of claims 1 to 23, additionally comprising removing excess powder from said perforated plate subsequent to directing powder into the perforation.

25. A method according to claim 24, comprising removing said excess powder by the action of a wiper.

26. A method according to any of claims 1 to 25, wherein the contents of the perforation are transferable by the action of a transfer pin.

27. A method according to any of claims 1 to 26, wherein direction of powder into the closed-off perforation and transfer into the blind cavity is a continuous step.

28. A method according to any of claims 1 to 27, wherein transfer of the contents of the perforation to the container comprises:

- reopening the perforation;
- placing the container in registration with the perforation; and
- transferring the contents of the perforation into the container.

29. A method according to any of claims 1 to 25, wherein the contents of the perforation are transferable by the action of a vacuum system.

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30. A method according to claim 29, wherein said vacuum system comprises a vacuum head and at least one vacuum cup.

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31. A method according to any of claims 1 to 30 additionally comprising compacting the powder in the perforation.

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32. A method according to claim 31, wherein the powder is compacted to a volume of between 70 and 100% of the original volume of powder in the closed-off perforation.

33. A method according to claim 31, wherein the powder is compacted to form a tablet.

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34. A method according to any of claims 31 to 33, wherein the powder is compactable by the action of a compacting pin.

35. A method according to either of claims 26 or 34, wherein the transfer pin and the compacting pin are integral.

36. A method according to either of claims 26 or 34, wherein the transfer pin and the compacting pin are identical.

37. A method according to any of claims 1 to 36, wherein the container is a blind cavity.

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38. A method according to claim 37, wherein the blind cavity is selected from the group consisting of a blister pocket, an injection moulded plastic pocket, a capsule and a bulk container.

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39. A method according to any of claims 1 to 38 additionally comprising applying a lid to the container to protect the contents therein.

40. A method according to any of claims 1 to 39, wherein the powder comprises a medicament.

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41. A method according to claim 40, wherein the medicament is selected from the group consisting of albuterol, salmeterol, fluticasone propionate and beclomethasone dipropionate and salts or solvates thereof and any mixtures thereof.

42. An apparatus for loading a container with a defined quantity of product, which comprises:

- a) a perforated plate;
- b) a closure for reversibly closing off a perforation in the perforated plate;
- c) a director for directing powder into said perforation, said director comprising a first leveller blade movable on a sweeping path relative to the perforated plate; and
- d) a transferor for transferring the contents of the perforation to said container,

wherein the first leveller blade is spaced from the perforated plate and presents a forward acute angle to the sweeping path.

43. An apparatus according to claim 42, wherein the closure comprises a blanking plate.

44. An apparatus according to claim 42, wherein the closure comprises a blanking pin inserted into the perforation.

45. An apparatus according to claim 44, wherein the blanking pin is moveable within the perforation to adjust the volume of the perforation.

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46. An apparatus according to any of claims 42 to 45, wherein the diameter of the closed-off perforation is between 1.5mm and 15mm.

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47. An apparatus according to claim 42, wherein the closure comprises the container placed in registration with the perforation.

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48. An apparatus according to any of claims 42 to 47, wherein said first leveller blade is movable across the perforated plate on a linear sweeping path.

49. An apparatus according to any of claims 42 to 48, wherein the forward acute angle is between 1 and 60°.

50. An apparatus according to claim 49, wherein the forward acute angle is between 5 and 25°.

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51. An apparatus according to any of claims 42 to 50, wherein the first leveller blade presents multiple forward acute angles to the linear sweeping path.

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52. An apparatus according to claim 51, wherein the first leveller blade is curved in form.

53. An apparatus according to claim 51, wherein the first leveller blade is articulated in form.

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54. An apparatus according to any of claims 42 to 50, wherein the first leveller blade has a flat tail section.

55. An apparatus according to any of claims 48 to 54, wherein the first leveller blade is positioned to leave a gap of between 3 and 20mm between the first leveller blade and the perforated plate.

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56. An apparatus according to claim 55, wherein the first leveller blade is positioned to leave a gap of between 4 and 8 mm between the first leveller blade and the perforated plate.

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57. An apparatus according to any of claims 48 to 56, wherein the director further comprises at least one subsequent leveller blade.

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58. An apparatus according to claim 57, wherein the at least one subsequent leveller blade is positioned closer to the perforated plate than the first leveller blade.

59. An apparatus according to claim 58, wherein the at least one subsequent leveller blade is positioned 0 to 12 mm closer to the perforated plate than the first leveller blade.

60. An apparatus according to claim 59, wherein the at least one subsequent leveller blade is positioned 1 to 3 mm closer to the perforated plate than the first leveller blade.

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61. An apparatus according to any of claims 42 to 48, wherein the perforated plate forms the rim of a drum.

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62. An apparatus according to claim 61, wherein the powder is directed into the closed-off perforations by gravity as the drum rotates.

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63. An apparatus according to any of claims 42 to 62, wherein the transferor comprises a transferor pin.

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64. An apparatus according to any of claims 42 to 62, wherein the transferor comprises a vacuum system.

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65. An apparatus according to claim 64, wherein the vacuum system comprises a vacuum head and at least one vacuum cup.

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66. An apparatus according to any of claims 42 to 65 additionally comprising a compactor for compacting the powder in the perforation.

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67. An apparatus according to claim 66, wherein the compactor comprises a compactor pin.

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68. An apparatus according to either of claims 63 or 67, wherein the transferor and compactor are integral.

69. An apparatus according to either of claims 63 or 67, wherein the transferor and compactor are identical.

70. An apparatus according to any of claims 42 to 69 additionally comprising registration means for registering the container with the perforation

71. An apparatus according to any of claims 42 to 70 additionally comprising a powder remover for removing excess powder from the perforated plate subsequent to action of the powder director.

72. An apparatus according to claim 71, wherein the powder remover comprises a wiper.

73. An apparatus according to any of claims 42 to 72 wherein the container is a blind cavity.

74. An apparatus according to claim 73, wherein the blind cavity is selected from the group consisting of a blister pocket, an injection moulded plastic pocket, a capsule and a bulk container.

75. An apparatus according to any of claims 42 to 74 additionally comprising a lid applier for applying a lid to the container to protect the powder therein.

76. An apparatus according to any of claims 42 to 75 further comprising powder.

77. An apparatus according to claim 76, wherein the powder comprises a medicament.

78. An apparatus according to claim 77, wherein the medicament is selected from the group consisting of albuterol, salmeterol, fluticasone propionate and beclomethasone dipropionate and salts or solvates thereof and any mixtures thereof

79. A tablet obtainable by the method according to any of claims 1 to 41.

80. Compacted powder obtainable by the method according to any of claims 1 to 41.

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